

Much myth surrounds the topic of antenna selection, and common mistakes are often repeated. We suggest consulting the "Technical Notes on Antenna Selection" section located on pages 317-321 in this catalog for guidance.

Choice of coaxial feedline is equally critical to system performance. Its job is to route the received and transmitted energy from and to the antenna with a tolerable minimum of energy loss. Charts included in the cable-section of this catalog help you determine the amount of loss to be expected from a specified length of cable in a stated frequency band. When the mobile station's signal strength, receiver quieting, antenna gain, path loss, base station antenna gain and height, transmitter power, and receiver sensitivity are known or assumed, then the amount of tolerable loss, and the diameter of the coaxial cable can be determined. Too small a cable diameter may squander precious signal and render the system useless or grossly sub-optimal.

DUPLEXER OR TWO SEPARATE ANTENNAS?

The answer to this question involves the tradeoff between tower "real estate," material and installation cost, and tolerable duplexer insertion loss and cost. Considering the additional wind-loading, site charges, and budget strain, dual antennas and lines with adequate physical separation are superior to using a duplexer because the duplexer loss is eliminated. However, the cost of a duplexer can be significantly lower than the initial installation cost and additional monthly site charges associated with a second antenna and line. Usually the argument is resolved in favor of the lower cost solution and a duplexer is specified.

TO COMBINE OR NOT TO COMBINE?

Similar to the duplexer discussion, the tradeoffs of insertion loss and cost must be evaluated. Sometimes a site operator will offer a master antenna via a transmitter combiner port as an alternative to furnishing your own antenna(s) and line(s). Depending on the manufacturer, the design of the combiner and the number of ports, the insertion loss per port can be as high as 7 dB. This can mean 80% of your transmitter power lost before it reaches the coax! In multi-channel trunking and cellular systems, this magnitude of loss is considered normal. For a UHF community repeater, however, such a power loss could be intolerable. Yet, given individual circumstances, there may be no other alternative. Using a transmitter combiner can "make it happen" where otherwise it would be impossible.

RECEIVER MULTICOUPLERS

Usually a companion piece to a transmitter combiner, the receiver multicoupler, or "mux," generally provides a front-end filter, amplifier and splitter in order to feed more than one receiver from the same antenna and line. Typically, a net gain is realized for each mux port. Celwave offers enhanced gain and noise specifications through the tower top amplifier pre-amp option, which is desirable when maximum "talk-in" is essential for system balance.

